CA2 ALEN
E55
1972 v.1 no.10

ALBERTA LEGISLATURE LIBRARY
3 3398 00482 7258

of the Environment.

G. Amerongen

LIBRARY
LEGISLATIVE LIBRARY
FEB 16 1978
EDMONTON

environment ne

PRINTED

BIGHORN: nearing completion

FEBRUARY 1972

Digitized by the Internet Archive
in 2024 with funding from
Legislative Assembly of Alberta - Alberta Legislature Library

RECYCLING

another way of looking at it

Enforced recycling to preserve resources could lead to environmental deterioration rather than improvement, according to one of the world's top environmental planners.

"Recycling is not a panacea - not something good by itself," warned Dr. Allen Kneese, director of the quality of the environment program for the famed Washington think-tank, Resources for the Future.

Several current recycling industries are among the dirtiest polluters known, Dr. Kneese told a session of the annual meeting of the American Association for the Advancement of Science.

A U.S. government study convinced the economist that it was better to throw wool away than let the wool recycling industry - a major dye polluter - handle it.

He emphasized that recycling also means increasing the North American trend towards urbanization, "which some of us think has already gone too far".

Economies of scale and proximity to supplies would force new recycling to concentrate around cities. If nutrients, such as phosphates

---

ENVIRONMENT NEWS is published monthly by the Alberta Department of the Environment, and is distributed free of charge. Address all correspondence to: Environment News, 7th Floor Milner Building, 10040 - 104 Street, EDMONTON 14, Alberta.

February 1972 VOLUME 1 NUMBER 10

Honorable W.J. Yurko
Minister

Dr. E.E. Ballantyne
Deputy Minister

and nitrites, were recycled, intensive irrigation facilities would be required around urban areas.

Dr. Kneese made his remarks during a probe of the roles of technology and growth in a world with limited resources. Other speakers suggested that North American could freeze both population and per capita economic growth in the next century without social upheaval.

The American economist and environmental planner is the leading exponent of using effluent fees to curtail pollution, a view adopted by the Canadian government in its approach to water pollution.

While recycling has a role to play in dealing with growing shortages of natural resources, other technical and social mechanisms can also have major impact, Dr. Kneese said.

Major improvements will be made in manufacturing processes, because virgin raw materials will be more expensive to acquire and more expensive to throw away. More durable products and a shift to modular design would also stem the drain on rare resources.

The emergence of a new form of pollution - tourism - was suggested to the same scientific session by Dr. Herman Kahn, noted futurist and director of New York's Hudson Institute.

"It's going to be one of the dominating effects of the century, Dr. Kahn said.

Article by Peter Calamar
Southam News Service

Cover photo: powerhouse under
construction showing two
steel penstocks.

Bighorn reservoir to fill this fall

The Bighorn dam and reservoir, a joint venture of the Alberta government and Calgary Power, will become operational in the fall of 1972. Work on the project started early in 1969, with the clearing of the area that is to become the reservoir. Since October, 1970, the river has been converted through a 22-foot diameter tunnel, during construction of the dam.

Construction of the dam and powerhouse are expected to be sufficiently advanced by the end of July, 1972, so that the intake to the diversion tunnel can be permanently closed and the reservoir allowed to fill. The exact date of this closure will be decided at that time, and depends on construction progress and stream flow conditions.

Approximately 80 days are required, after the diversion tunnel is closed, for modifications to be made to the tunnel for its use as a power conduit. After this period of time, water will be released to the river from the reservoir through Calgary Power's two turbines in the powerhouse.

Filling the Reservoir

Water will be stored in the reservoir during August, September and October of 1972, during the time when the diversion tunnel will be closed. For the first 15 to 25 days, the "dead" storage will be filled. Dead storage is the water that cannot be withdrawn from the reservoir, or the water between the reservoir bottom and the intake tunnel. This amounts to 265,000 acre feet (one acre foot is the amount of water required to cover one acre to a depth of one foot). By the end of October, the amount of active storage available is expected to be between 270,000 and 715,000 acre feet. This is dependent on rainfall and the amount of snow remaining in the mountain peaks in the fall of 1972.

The active storage accumulated during the three-month period will be released during the winter of 1972-73 through the power plant, which will be operating for a period of time each day.

The timing of the closure of the diversion tunnel is critical. If the tunnel were closed at the end of August, and 1972 turned out to have a dry summer and fall, there would be little likelihood of any active storage being available for release during the winter months. On the other hand, if closure were made in early July and a wet summer followed, it might become necessary to spill from the full reservoir late in September. The reservoir's spillway is for emergency use only, and its use in the fall of 1972 is not considered advisable.

Annual Replenishing

The water accumulated during the fall of 1972 will be released during the winter, and by the spring, the reservoir will be reduced to dead storage. Filling the reservoir will start again in May of 1973, and every year thereafter, when stream flow rises from melting snow in the mountainous drainage shed.

The reservoir is expected to reach its maximum level in mid-September of every year, and will decline during the winter as power plant discharges augment the flow of the river.

In a year in which August runoff is below normal, the reservoir is not expected to fill to its full capacity of 1.1 million acre feet of of water. There is more than ample inflow to fill the reservoir every year, but while the reservoir is filling, water will also be released daily through the power plant. This daily release to the North Saskatchewan River will depend on the available storage, rate of inflow into the reservoir, and the amounts of water required downstream.

Effects of Initial Storage on the River

The first major tributary of the North Saskatchewan River below the Bighorn Dam is the Bighorn River, five miles downstream. During the fall of 1972, when the reservoir is filling, flow will be available in the North Saskatchewan River except for the first five miles, where water will stand in pools since none will be released from the reservoir.

With a number of rivers and creeks entering the North Saskatchewan before it reaches Rocky Mountain House, the flow there in the fall of 1972 will be, at the very minimum, one third of the flow which would have occurred if storage were not taking place.

At Edmonton, the flow in the river will be about 70 per cent of normal, if a wet August and September occurs. Should these two months be very dry, there will be a marked reduction in the river flow. Should this occur, stored water from the Brazeau Reservoir will be used to augment flow in the North Saskatchewan River to the degree necessary to maintain a flow of 2,000 cubic feet per second at Edmonton.

Brazeau Dam and reservoir were constructed by the province in 1959-62 to augment winter flow in the North Saskatchewan River. Since 1962, it has been possible to maintain an average winter flow of approximately 2,000 cfs at Edmonton, except during the winter of 1970-71 as a result of below normal storage in the reservoir.

The five-mile stretch of river between the dam and the Bignorm River will not receive any water during the initial reservoir filling period of August to October 1972. To provide flow in this reach of the river during this time would require a temporary movable pumping installation to life water over the dam. This would reduce the amount of water stored behind the dam, and decrease the volume of storage available for the coming winter.

Releasing Water from the Reservoir

Water will be released from the power plant which will come into service in early November, 1972. The power plant will have two turbine generators, each of which will be capable of discharging 2,500 to 3,000 cubic feet per second, depending on the level of the reservoir.

The plant, one or both units, will normally operate every day for several hours. One turbine, should the other not be operating, is capable of passing the long term average discharge of the river.

All water will be released at the power plant. The spillway, located one mile north of the dam, is for emergency use only.

Serious damage to the transmission line due to snow slides, sleet storms or forest fires might require the power plant to shut down for a few days to a week. Should this ever occur, release of water from the reservoir would be some 300 cfs during the period of repair.

After October, 1972, there will always be a flow of water in the river between the dam and the confluence of the Bighorn River. The long term average discharge from the dam will be about 2,700 cfs.

Operation of the plant for 14 to 16 hours each day will cause a fluctuation of the flow in the river, as water is alternately released and held back. The greatest effect of this will be felt immediately downstream of the dam site. Once other tributaries join the North Saskatchewan River, this effect will be minimized. Even when the power plant is not operating, a small flow of water will be passing through the turbines, resulting in a small flow always being present in the river.

Ecological Impact of the Dam

After Bighorn reservoir is filled, the part of the river most affected will be the section from the dam to Saskatchewan Gap, 20 miles downstream, where the river leaves the mountains.

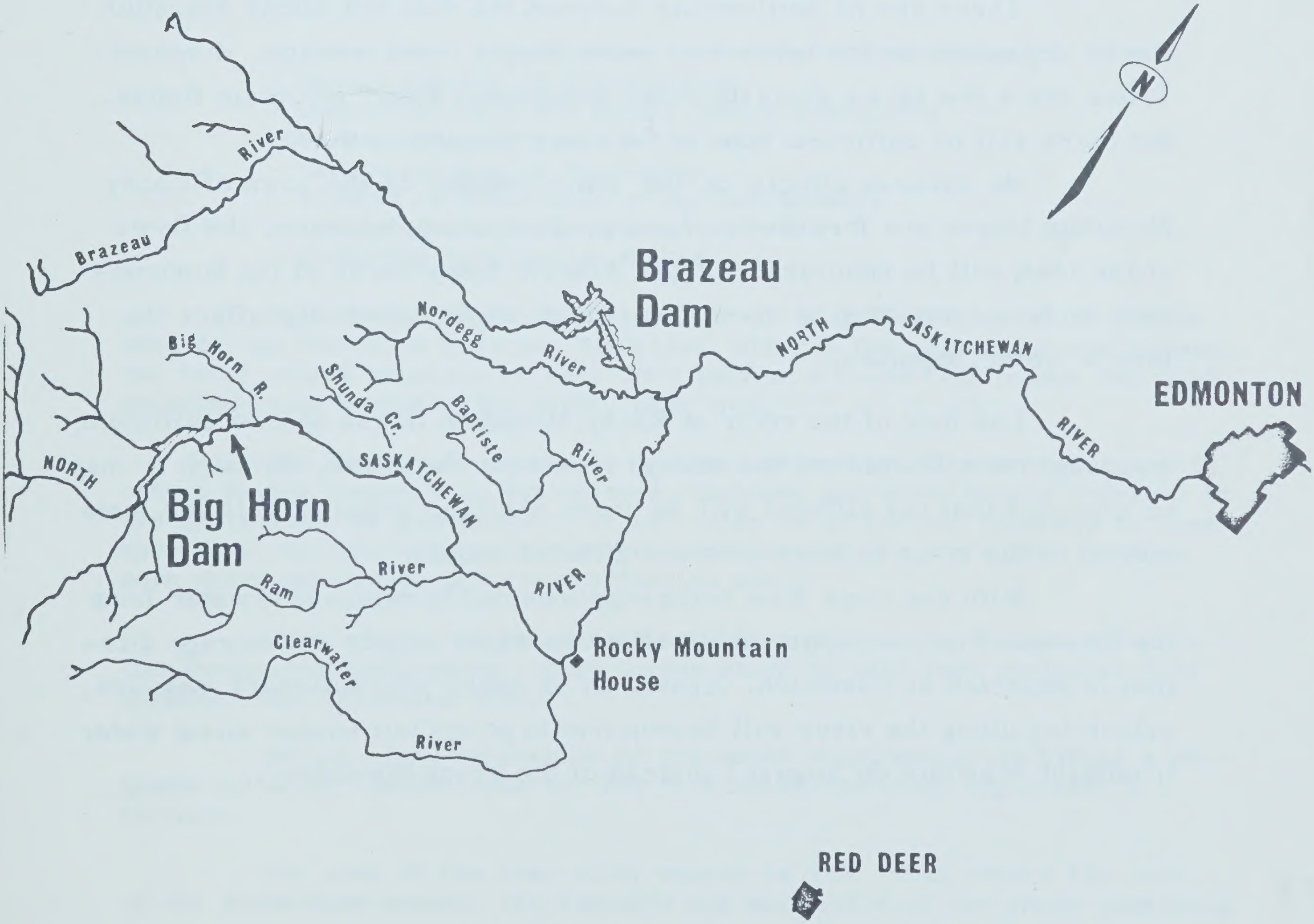
This broad valley has ill-defined channels, low banks and limited vegetation. The storage of high June-July river flow at Bighorn may in time result in gradual forest encroachment of the flood plain.

Settlement of suspended sediment in the reservoir will noticeably clarify the river as far downstream as the Ram River, and some erosion may occur in 1973 at occasional sand bars in that section of the North Saskatchewan River. Due to increased discharge in winter below the Bighorn reservoir, the river about Rocky Mountain House is expected to remain free of complete ice cover for a longer period than at the present.

Downstream of Edmonton, the North Saskatchewan River flows in an entrenched valley as far as Tobin Lake, the reservoir behind Squaw Rapids Dam near Nipawin, Saskatchewan.

There are no low gradients, braided channels on the North Saskatchewan River upstream of Tobin Lake, comparable to the Peace River delta. Thus any changes in flow occasioned by the operation of the Bighorn reservoir in summer cannot dry out large expanses of land or river channel. No appreciable changes in vegetation cover and wildlife habitat are expected downstream of Ram River.

Below Squaw Rapids, regulation of the Saskatchewan River flows by that plant and by the Grand Rapids plant of Manitoba Hydro is more extensive than anything which might be possible with the smaller Bighorn reservoir situated several hundred miles upstream.



The effects of the 80-day closure on fish will depend to a large degree on the depth and frequency of pools which will remain standing in the river bed. Some fish will concentrate in these pools, while others will move downstream to areas where there is continuous flow.

There is very little chance of ice cover on the pools during the August to October period, and if it should occur, it would not be a severe, long lasting freeze over. Organisms on which fish feed will also concentrate in these pools, so there will be sufficient food. It is expected that the total population of these organisms will decrease during this period, and it may take up to a year for the organisms to regenerate to their present population.

Effects on Communities

There are no settlements between the dam and Rocky Mountain House dependent on the river for water supply and sewage disposal. There are a few farms along the river upstream of Rocky Mountain House, but there will be sufficient flow in the river to service these.

No adverse effects on the water supply of the town of Rocky Mountain House are foreseen. As a precautionary measure, the flows at the town will be monitored by the Alberta Department of the Environment to detect any drop in river flow which might adversely affect the town's water supplies.

The flow of the river at Rocky Mountain House will be sufficient to accept the effluent from the sewage treatment facilities, although it may be expected that the effluent will be more visible, especially if the main stream of the river is away from the effluent outfall.

With the river flow being supplemented by releases of water from the Brazeau Dam, no appreciable effect on water supply and sewage dilution is expected at Edmonton. Again, as an added precautionary measure, industries along the river will be required to go on their winter waste water treatment schedule on August 1 instead of the usual November 1.

COURSES OFFERED IN PESTICIDE USE

The rapid expansion in the use of herbicides, insecticides and fungicides has resulted in tremendous benefits, including marked increases in efficiency of food production. However, new technology presents certain dangers and adequate safeguards must be established. This home study course has been prepared in order to assist frequent users of pesticides in gaining further knowledge about some of the principles and methods of effective and safe application.

The course consists of eight lessons dealing with the following aspects of pesticides:

- History and Introduction to the Use of Pesticides
- Nature and Use of Insecticides
- Characteristics and Proper Use of Herbicides
- Herbicides and Their Use in Alberta
- Nature and Use of Fungicides
- Effects of Pesticides on Man and Animals
- Legal Aspects of Pesticide Use
- Pesticide Application Methods

Each lesson is followed by a set of study questions which can be sent to the Vermilion College, Vermilion, Alberta for correction and comment. The total course consists of over 200 pages in a loose-leaf binder for handy reference plus a Pesticides Safety Hand Book.

The home study course is designed primarily for commercial applicators, health inspectors, agricultural fieldmen and other people involved in the application of pesticides. It will also be of use and interest to form operators, agricultural extension personnel and anyone who wishes to know more about pesticides and their effective use.

This course, or its equivalent, is a prequisite for admission to the Pesticides Applicators' Short Course which is held each spring at Olds College. (See following story).

Satisfactory completion of the above requirements qualifies a candidate to write examinations for the Provincial Pesticide Applicator's Licence.

The cost of the home study course is $25. This covers the cost of the loose-leaf manual, its contents and correction of the study questions.

Further information may be obtained by writing to:

Pesticide Home Study Course
Vermilion College
VERMILION, Alberta.

The fifth Pesticide Applicators Training Course will be held at the Olds College in Olds, March 20 to March 30. In Alberta, 'commercial' pesticide applicators are required to be licenced. Qualifications for licence include formal training and experience.

Persons without previous training should attend all of the sessions Monday, March 20 to Thursday, March 30 inclusive.

Persons wishing up-to-date information with regard to all pesticides and their application are invited to attend this course. It is the only one of its kind in western Canada. Every session will be addressed by well qualified instructors.

The first week (March 20 - March 24) emphasizes practical (laboratory) work in entomology, botany, plant pathology, and lessons in chemistry, herbicides, insecticides, fumigants, and animal pest control. Persons wishing information in this general area must register for the full week of the course. They may also register for one or more days of the second week.

The second week (March 27 - March 30) will be offered on a daily basis. It is intended for specialist groups and for up-dating information for those with previous training.

Tuition fees, which include mimeographed notes and a three-ring binder, will be $5 a day. Room and board in the college residence is $9 a day. Total course cost, including tuition and room and board for the one week session (March 20 to March 24) is $70. Total cost for the nine day course (March 20 to March 30 - not including the weekend) is $126. Persons wishing to attend the whole or any portion of the course are asked to register prior to Monday, March 13, 1972. Persons registering on the first morning of the course will be assessed a late registration fee of $5.

For further information, contact the Registrar, Olds College, Olds, Alberta.

IN BRIEF

Provincial researchers have found a higher death rate from lung cancer in urban compared with rural communities in Alberta.

They are studying the possibility of a link with air pollution.

The finding is just one phase of a three-year, $130,000 study, Health Effects of Air Pollution in Alberta, being conducted by the provincial department of health in collaboration with the department of community medicine, University of Alberta.

Project Director Dr. E.S.O. Smith, who is also director of the health department's epidemiology division, warns that the finding still has to be correlated with air pollution samples being taken in nine communities, including Edmonton and Calgary.

"From an analysis of deaths which occurred during the five-year period 1964-68, it has been found that mortality from lung cancer among both males and females is significantly higher in urban than in rural communities," Dr. Smith says in a progress report.

A federal scientist said recent activities of the new Environment Conservation Authority may provide Alberta's last chance to stem "radicalization" of youth on environmental issues.

Dr. Drake Hocking, a plant scientist with the federal environment department, said that unless it can be shown that government and industry mean to take real action, young people will drift to more extreme solutions.

However, he said there are strong signs of a new awareness on the part of industry and government. Referring to recent tough statements by Alberta's environment minister, he said it is obvious "the heat is on".

The Honorable W.J. Yurko, Minister of the Environment, announces that municipal sewage facilities valued at nearly $13.5 million were initiated in Alberta during 1971.

Of this amount, $9 million, or 66 percent of the total value, was loaned by the Central Mortgage & Housing Corporation. C.M.H.C. makes money available to the province, and the Alberta Department of the Environment recommends municipal sewage treatment projects for assistance.

Mr. Yurko notes that in 1971, a total of 34 communities took advantage of the program. If the approved projects are completed by 1975, C.M.H.C. will forgive the municipality 25 percent of the loan.

The City of Calgary received $2,553,667., followed by Red Deer ($1,500,000.) and Edmonton ($1,343,310.).

Other municipalities receiving major shares of the funds are Athabasca ($96,400.); Carstairs ($91,159.); Cochrane ($131,433.); West Edson ($113,335.); Fox Creek ($98,924.); Grande Prairie ($333, 350.); Lac La Biche ($150,000.); Lethbridge ($917,334.); Medicine Hat ($106,670.); Stony Plain ($304,000.); Strathmore ($90,677.); Taber ($118,000.); and Westock ($172,340.).

Alberta was originally allotted $3 million, but following consultation with federal authorities, this figure was later tripled.

Associated Engineering Services Ltd. of Edmonton will conduct a feasibility study on the establishment of sites for multiple waste disposal in Alberta.

The study, to be completed by the end of March, is a provincially-financed winter works program.

It will categorize the types and quantities of complex wastes produced in Alberta, and the possible disposal methods for these. The project will concentrate on exotic and toxic wastes, many of a chemical nature, which are difficult to dispose of by conventional means.

Associated Engineering Services will establish criteria for disposal sites, and make recommendations on the most feasible sites in Alberta, taking into consideration such factors as environmental, economic and social consequences.

The final report will show the operation of various disposal methods, estimated operating and capital costs, guidelines for fees to be charged to the users, and recommended monitoring for environmental protection.

Mr. Yurko notes that the Department of the Environment has survyed approximately 250 industries in the province to determine the types and volumes of wastes produced, and the present disposal methods. This information will be made available to the consulting firm.

A detailed multi-disciplinary study is under way on the environmental impact of "twinning" the Trans-Canada Highway from the east gate of Banff National Park to just outside Banff townsite.

The study of possible routes and their likely effect upon the vegetation, wildlife water supply, geology and historic sites in the area will be completed prior to construction getting under way.

A comprehensive oil spill contingency plan has been developed for Alberta.

The plan is part of a first step taken by the Canadian oil industry to prevent oil spills and in the event they do occur, to clean them up with minimum damage.

According to the Petroleum Association for Conservation of the Environment, formed last year by major oil companies, a book has been made of results of a cross-Canada inventory of resources to control oil spills.

Copies of the book have been distributed to PACE's 12 major companies, to provincial premiers and to federal and provincial departments of the environment.

PACE was recently granted a national charter as a non-profit organization and is planning establishment of its own office with full-time personnel.

When notifying Environment News of a change of address, please enclose mailing label found on the back of this page, or quote your subscription number.

SUPPORT
EDUCATION
WEEK

EDMONTON
-1 III '72
ALBERTA
METER
COMPTEUR
152293
CANADA
POSTES
06

Return to:

Environment News
7th Floor Milner Building
10040 - 104th Street
EDMONTON 14, Alberta.